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ILLINOIS STATE BOARD OF HEALTH.

PREVENTABLE-DISEASE CIRCULARS.

No. 4.--TYPHOID FEVER.

WHEN it is considered that, one year with another, over 2,000 *people die annually in the State of Illinois from Typhoid Fever; that upwards of* 14,000 *more are disabled by it for an average period of three months each; that these persons are taken from all classes of the community, and at all ages between* 5 *and* 40 *years—a large proportion during the productive or self-sustaining period; and when it is further considered that the disease is believed, on the one hand, to be as communicable as small-pox or measles, and, on the other, is asserted to be "altogether and easily preventable," the duty of health officers, sanitarians and medical men, with reference to its suppression, would seem too obvious to need further emphasis or explanation.*

TYPHOID FEVER.

Typhoid Fever has been fitly termed "the type of the filth-diseases." Without reference to the question whether it may originate in, or be caused by, the gases and other products of putrid animal matter, its prevalence unquestionably bears a constant relation to the condition of the sanitary surroundings.

Where there is a polluted water-supply; where there is undrained ground, contaminated with excremental filth; where foul, over-flowing or leaky privy-vaults soak the earth for rods with their contents; where defective, unventilated sewers and "skin" plumbing abound, there does Typhoid Fever find its most numerous victims.

From such localities the contagion, finding its way by various unsuspected channels, may invade the most cleanly and carefully-ordered household. The frequent mode by which it is spread is through the water-supply. A small quantity of the infectious matter of the disease is sufficient to poison the contents of a well or cistern, and thus to give rise to an outbreak among the susceptible who depend upon such source of supply. Or this water may, as has frequently been proved, be used for dairy purposes, and so introduce the infection into families, supplied with milk from such dairy, miles away from the source of danger.

The poison of Typhoid Fever exists, principally, in the discharges from the bowels of those suffering with the disease; and so well has the deadly character of such discharges been established, that attempts have been made to secure legislation enforcing the compulsory disinfection of the intestinal evacuations of all Typhoid-Fever patients. This is, of course, impracticable; and whatever is done in this direction to limit the prevalence of the disease, can only be accomplished through the spread of knowledge concerning its character and mode of diffusion. In this work boards of health can do little unaided by the Family Physician. Upon him rests the responsibility of seeing that thorough disinfection is carried out in every case of Typhoid Fever he may be called to treat.

To assist in the discharge of this responsibility, the following memorandum, concerning the sanitary aspects of Typhoid Fever, and the instructions as to disinfection, etc., have been prepared, and are published in the hope of making more effective the efforts to restrict the spread of a disease which so eminent an authority as Dr. Parkes has pronounced "altogether and easily preventable."

TYPHOID FEVER:

ITS SANITARY FEATURES—PREVENTION OF ITS SPREAD.

I—ITS SANITARY FEATURES.

1. For sanitary purposes, Typhoid Fever is a contagious disease. Its specific poison will produce the same disease if introduced into the system of a susceptible healthy individual.

2. Like small-pox, scarlet fever, and many other contagious diseases, one attack of Typhoid Fever, as a rule, protects from subsequent attacks.

3. The specific poison of Typhoid Fever is contained in the diarrheal discharges (and, possibly, in other excretions and the exhalations,) of the patient. If these obtain access to a water-supp y, or to articles of food or drink, an outbreak of Typhoid will follow among those partaking of such water or food. Repeated instances of this kind have been traced to the use of water from an infected well and to infected milk.

4. The diarrheal discharges, when dry, may preserve the poison as effectually as the crusts of small-pox, the scales of scarlet fever, and the dried membrane of diphtheria, preserve the specific poisons of those diseases.

5. These discharges, coming into contact with putrid animal matter, as by being thrown into water-closets and privies, are capable of saturating such matter with the Typhoid-Fever poison in its most concentrated and virulent form.

6. Typhoid Fever may, therefore, be propagated in either of the following ways: (*a*) By poisoning the water-supply through direct access of the discharges, or by their percolation through the soil. (*b*) By the aerial dissemination of the poison in dried particles of discharges or other excretions. (*c*) By exhalations from sewers, water-closets, privies, or other receptacles of these discharges.—By modes (*a*) and (*b*), articles of diet, both liquid and solid, may be contaminated, and thus give rise to outbreaks of the disease.

7. From the foregoing the deduction is obvious that the important sanitary indication, during the existence of a case of Typhoid Fever, is to subject the intestinal discharges and other excretions of the patient, to such process of disinfection as will destroy the specific poison contained, and to do this promptly and efficiently.

II—PREVENTION OF ITS SPREAD.

1. When a case of Typhoid Fever is known to exist in a neighborhood, strict examination should be made regarding the surroundings and character of the water-supply of the locality. If there be any reason to suspect that this may be possibly contaminated from the case, its use should be forbidden until the proper measures can be taken to protect it against such contamination, and the question of its safety

be definitely settled. The location of wells, with reference to the privy into which Typhoid discharges are thrown, the inclination of the ground between such points, and the character of the soil, should all be taken into consideration. Wells into which surface-washings from the infected premises might find their way by the natural slope of the ground, and wells within a given distance of the privy of such premises, should be at once abandoned. The contaminating distance varies according to the nature of the soil and the depth of the well; in a loose, porous soil, a well 30 to 40 feet deep will be dangerous if within 100 feet of Typhoid premises.

2. If the case exists in a sewered neighborhood, every householder whose premises connect with a sewer in common with the infected house, should have a thorough inspection made of the drainage of his own premises. If the sewer connection be not broken by a proper ventilating shaft, extending above the highest point of the roof, such shaft should be provided forthwith. All interior plumbing should be examined, defective joints repaired, traps put in order, and the flushing devices of water-closets made effective.

3. Scrupulous cleanliness in every portion of the premises should be enforced. All decaying animal and vegetable matter, and every kind and source of filth in and around the house should be removed, and disinfectants be freely used. Surface drains and gutters, areas, outhouses, privies, shelters for domestic animals, fowls, etc., should receive close and constant attention, and the *Copperas Disinfectant* (see page 8) be used freely and regularly in every such place.

4. The precautions recommended to prevent the extension of the nfection to other localities, are of even more importance upon the premises where a case of Typhoid Fever exists. Here there is the greatest danger of the poison finding lodgment in the soil which favors its growth and intensity, namely, filth in any form. Therefore, the advice given in No. 3 should be rigidly carried out, in its every detail, upon the infected premises.

5. Within the infected house itself the important matter to attend to is the prompt disinfection of the discharges from the patient, and of every thing liable to come in contact with such discharges. The following details should be observed:

(*a*) All discharges should be received in vessels containing a quart or so of the *Zinc Disinfectant* (see page 8) or a gill of a concentrated (5 per cent.) solution of chloride of zinc. (*b*) If there be a water-closet, this should be used exclusively for the discharges from the patient while the fever lasts, and the receptacle should be flooded three or four times a day with the *Zinc Disinfectant*. (*c*) When practicable—instead of being thrown into a privy—the discharges, after being thoroughly disinfected, should be buried in the ground, at least 100 feet away from any well or other source of water-supply. (or tub of the *Zinc Disinfectant* should be kept in the sick-room, and into this all clothing, blankets, sheets, towels, etc., used about the patient or in the room, should be dropped immediately after use, and before being removed from the room. They should then be well boiled as soon as practicable. Rags, closet-paper, or other material used about the person of the patient, should be immediately burned. (*e*) The sick-room should be large, easily ventilated, and as far from the living and sleeping-rooms of other members of the family as it is practicable to have it. All ornaments, carpets, drapery, and articles not abso-

lutely needed in the room should be removed. A free circulation of air from without should be admitted both by night and day—there is no better disinfectant than pure aid. P ace the bed as near as possible in the middle of the room; but keep the patient out of draughts. (*f*) Not more than two persons, one of them a skillful, professional nurse, if obtainable, should be employed in the sick-room, and their intercourse with other members of the family should be properly restricted. If possible, the attendants should be selected from those who have already had Typhoid Fever. In the event that it becomes necessary for an attendant to go away from the house, a change of clothing should be made, using such as has not been exposed to infection; the hands, face and hair should be washed in thymol water, or chloride of zinc solution—half an ounce of chloride of zinc to one gallon of water.

6. After recovery, or during convalescence, the patient is to be considered dangerous so long as the intestinal discharges continue to be more copious, liquid and frequent than natural; and disinfection should be maintained until the attending physician advises that it is no longer necessary.

7. In the event of death, the clothing in which the body is attired should be sprinkled with thymol water, the body wrapped in a disinfectant cerecloth (a sheet thoroughly soaked in the *Zinc Disinfectant, double strength,*) and placed in an air-tight coffin, *which is to remain in the sick-room until removed for burial.* Public funerals are not advisable.

8. After recovery or death, all articles worn by, or that have come in contact with the patient, together with the room and all its contents, should be thoroughly disinfected by burning sulphur. To do this, have all windows, fire-places, flues, key-holes, doors, and other openings securely closed by strips or sheets of paper pasted over them. Then place on the hearth or stove, or on bricks set in a wash-tub containing an inch or so of water, an iron vessel of live coals, upon which throw three or four pounds of sulphur. All articles in the room and others of every description that have been exposed to infection, which can not be washed or subjected to dry heat, and are yet too valuable to be burned, must be spread out on chairs or racks; mattresses or spring-beds set up so as to have both surfaces exposed; window-shades and curtains laid out at full length, and every effort made to secure thorough exposure to the sulphur fumes. The room should be kept tightly closed for twenty-four hours. After this fumigation—which it will do no harm to repeat—the floor and wood-work should be washed with soap and hot water, the walls and ceiling white-washed, or, if papered, the paper should be removed. The articles which have been subjected to fumigation should be exposed for several days to sunshine and fresh air. If the carpet has unavoidably been allowed to remain on the floor during the illness, it should not be removed until after the fumigation; but must then be taken up, beaten, and shaken in the open air, and allowed to remain out of doors for a week or more. If not too valuable, it should be destroyed; but, whenever practicable, it should be removed from the room at the beginning of the illness.

After the above treatment has been thoroughly enforced, the doors and windows of the room should be kept open as much as possible for a week or two. Where

houses are isolated, articles may be exposed out of doors. The entire contents of the house should be subjected to the greatest care, and when there is any doubt as to the safety of an article *it should be destroyed.*

All this work should be done—both the disinfection and the destruction of property—under the direct supervision of the local authorities or attending physician.

9. Such articles of clothing, bedding, etc., as can be washed, should first be treated by dipping in the *Zinc Disinfectant*; they should then be immediately and thoroughly boiled.

The ticking of beds and pillows used by the patient should be treated in the same manner, and the contents, if hair or feathers, should be thoroughly baked in an oven. If this cannot be done, they should be destroyed by fire, as should, in any event, all straw, husk, moss, or "excelsior" filling. The clothing of nurses should be thoroughly fumigated and cleaned before it is taken from the house, or, better still, burned, if feasible.

10. Cases of Typhoid Fever should be promptly reported to the proper health authority by the attending physician, or by the head of the family. Immediately upon receipt of notice of the existence of a case, the health officer should visit the locality and secure prompt compliance with the precautions above set forth. He should make a careful investigation as to the probable cause of the outbreak, and if this he found to be due to an infected water- or milk-supply, the use of such supply should be rigidly interdicted, and the necessary steps at once taken to correct the evil.

He should superintend the disinfection of rooms, clothing and premises; and, finally, give official certificates of recovery, and of freedom from liability to communicate the disease to others. Until these lattar are issued, a system of isolation or quarantine should be maintained with regard to an infected house and its contents—persons and things.

In the event of death from a malignant case, or where there are a number of severe cases in one house or locality, the health officer should exercise even greater authority than here indicated. He should enforce disinfection, cleansing of premises, abandonment of suspected water, and other measures, arbitrarily, if necessary; and, in his discretion, should forbid public funerals where the conditions—either of the disease as to virulence, or of the sanitary surroundings—warrant such a course.

Where there is no health officer, the attending physician should see that the proper precautions are carried out, as herein advised.

11. Painless diarrhea, or simple "looseness of the bowels," occurring, in one who has never had Typhoid Fever, should excite suspicion while this disease exists in a neighborhood. The disease varies in the intensity of its symptoms, so that mild, walking cases are not uncommon. It is advisable, therefore, that *all* diarrheal discharges should be disinfected during the existence of Typhoid Fever in a community.

Best Disinfectants.

Sunlight, fresh air, soap and water, thorough cleanliness—for general use.

For special purposes the following are the most efficient, the simplest and the cheapest.

I.—Copperas Disinfectant.

Sulphate of iron (copperas).....one and one-half pounds.
Water.....one gallon.

A convenient way to prepare this is to suspend a basket containing about sixty pounds of copperas in a barrel of water. The solution should be frequently and liberally used in cellars, privies, water-closets, gutters, sewers, cess-pools, yards, stables, etc.

II.—Sulphur Disinfectant.

Roll sulphur (brimstone).....two pounds.

To a room ten feet square, and in the same proportion for larger rooms. See *Rule* 8, of Section II., for mode of use.

III.—Zinc Disinfectant.

Sulphate of zinc (white vitriol).....one and one-half pounds.
Common salt.....three-quarters of a pound.
Water.....six gallons.

For application and modes of use see *Rules* 5, 7 and 9 of Section II.

IV.—Thymol Water.

Made by adding one tablespoonful *Spirits of Thymol* to half a gallon of water. *Spirits of Thymol* is composed of—

Thymol.....one ounce.
Alcohol, 85 ℅ ct.....three ounces.

May be used for all the disinfectant purposes of carbolic acid; it is quite as efficient in this strength, and has an agreeable odor. See *Rules* 5 and 8 for application and uses. Where thymol is not available, chloride of zinc solution may be used—half an ounce of chloride of zinc to one gallon of water.

THIS CIRCULAR SHOULD BE PRESERVED FOR REFERENCE.

COPIES OF THIS CIRCULAR CAN BE OBTAINED BY APPLYING TO THE SECRETARY OF THE STATE BOARD OF HEALTH, SPRINGFIELD.